

REMARKS

Applicants respectfully request that the foregoing amendments, canceling claim 24 and amending claims 16, 20 and 22 in response to the § 112, ¶2, rejection, be entered in this application. Claims 10-23 remain in the application for examination, with claim 10 being the sole independent claim.

The objection of the drawing is believed to be obviated by cancellation of claim 24, the only product claim that recites corrugated fins. According to applicable PTO practice, method claims (e.g., claim 23) need not be illustrated.

Reconsideration of the rejections of claims 10, 16, 20 and 22 as being indefinite under 35 U.S.C. § 112, ¶2, is respectfully requested in light of the clarifying amendments that have been made above in claims 16, 20 and 22, and the following remarks with regard to claim 10.

Applicants respectfully request reconsideration of the rejection of claim 10. Claim 10 recites that the claimed tube has “a hollow interior” and that the “embossment in the opposing tube wall . . . is directed toward the inside of the tube.” It is not understood how this language might be indefinite, i.e., that the embossment protrudes inwardly toward the inside or the hollow interior of the tube. Of course, this relationship is made perfectly clear to a person of ordinary skill in the art from the description in the specification and drawings. Applicants are not clear how the PTO would propose to make the claim clearer than it is; however, they would be pleased to accept any clarifying language that the PTO might proffer.

Similarly, Applicants do not understand how the language calling for the “embossment . . . [to be] deformable in response to tolerance variations of the at least one web” is indefinite, and they therefore respectfully request reconsideration of the rejection on this basis. This is especially true when one considers the explanation and description contained in the present application:

The arrangement of a plateau-like embossment on the longitudinal face of the tube located opposite a web back produces a sprung and/or deformable abutment in the tube wall on which the web back is supported when the tube is standardized. When there is a slight excess in the dimensioning of the height of the web back, the embossment, which is level before the standardization, can deform outward and thus take up the excess dimension. (Paragraph bridging pages 2-3.)

As explained in the application, it is advantageous to make certain that the multi-chamber tubes according to the invention have a uniform thickness, in order that the usual corrugated fins that are subsequently applied to the outer flat faces of the tubes can be soldered to the tubes without any gaps, which adversely affect heat transfer between the tubes and fins. When forming a multi-chamber tube by the technique of the invention (i.e., by bending/folding webs (or crimped protrusions) 8 out of the tube wall and soldering the ends of these webs to the opposing wall), there is a certain tolerance variation in the lengths of the webs 8. According to the invention, the mating embossments 15 are configured so that they can deform in response to the slightly unequal lengths of the webs 8, and this permits the tube to be standardized to a constant thickness, as desired for good bonding of the corrugated fins.

The claim language is not indefinite, inasmuch as the embossments are either deformable in response to tolerance variations of the webs or not. As can be seen from the drawings, the embossments according to the invention have a shape that permits the central portion of the embossments to flex up and down, i.e., to deform in response to length variations of the webs. Thus, the person of ordinary skill in the art fully understands the meaning of the claim language and is capable of determining whether an embossment design lies within or outside of the claim scope. Applicants therefore respectfully request that the rejection on this basis be reconsidered and withdrawn. Applicants do not know how to more clearly express this relationship, but again, they are open to any suggestion that the PTO may wish to put forth.

Claim 16 has been amended to change "the longitudinal face" to "the longitudinal tube wall, in order to track more closely the language of the independent claim. Further, claim 10 recites that there is "in the region of the soldered connection of the at least one web to the opposing tube wall, an embossment in the opposing tube wall." Thus, it is believe clear that an embossment is located facing each of the recited webs.

Claim 20 has been amended to refer to "tolerance variations," in order to more exactly track the language of claim 10.

Claim 22 has been amended in several locations to make the relationships clearer. The term “corresponding” has been changed to “said,” in order to make clear that reference is being made to the embossments recited in claim 10. With regard to the term “web,” it is emphasized that this term in the present application defines the folded or crimped protrusions 8 that are formed to inwardly extend from the flat sheet of material. Thus, each web 8 faces one embossment 15, both of which are formed out of the same sheet of material, which is then bent around so that the two elements face one another. Proper antecedent basis has also been provided. Finally, the “standardizing” language has been amended to refer to a “predetermined constant thickness d between its two flat longitudinal wall faces,” as described in the full paragraph on page 5 of the specification. It is believed that the person skilled in the art fully understands the claimed invention, especially in light of the specification.

The claims that are believed to fully comply with the requirements of 35 U.S.C. § 112.

It is also respectfully requested that the rejection of claims 10-15 and 19-21 under 35 U.S.C. § 103 based upon FR 27 80 153 (“FR ‘153”) in view of certain alleged AAPA or, in the case of original claims 16-18, in view of US 5,704,423 to Letrange (“Letrange”) be reconsidered and withdrawn. For reasons set forth below, Applicants respectfully submit that the claims are patentable over the cited prior art.

The basic issue underlying the repetition of the rejection appears to be that the PTO is ignoring certain language in the claims and/or not giving due weight to such language, on the grounds that it is function and/or indefinite. See, the allegations of “indefiniteness” that have been addressed and traversed above. There is nothing inherently wrong with defining structure, in the context of a patent claim, in terms of the way in which the structure functions, as long as the language is not-indefinite. As explained above, the language of claim 10 defining the structure of the embossments, in terms of their deformability, is not indefinite and provides an ascertainable scope to the claims. It is equally clear that the structure shown in the prior art does not function in the manner recited in the claims, and the prior art (which has a completely different purpose) furthermore does not teach the claimed

invention. Thus, in the absence of an anticipating structure in the prior art, there is certainly nothing in the prior art that teaches the claimed invention and its mode of operation, which is different from that of the prior art FR '153 reference.

As previously explained, independent claim 10 differentiates structurally and patentably over the design shown and described in FR '153 in the following respects. Claim 10 defines "an embossment in the opposing tube wall which is directed toward the inside of the tube and which forms a surface that is deformable in response to tolerance variations of the at least one web." The structure shown in FR '153 does not meet this definition and does not function in the same way as the claimed invention.

FR '153 shows a multi-chambered flat heat exchanger tube in which a V-shaped depression 32 is formed when the tube wall 12 is folded in and layers 20 and 22 are joined together to form the "web" that extends to the opposite side of the tube interior. A corresponding V-shaped indentation 34 is formed in the opposite tube wall 14. However, this indentation 34 has a basically triangular shape, which renders it non-deformable, and the indentation is placed in the tube of FR '153 for a completely different purpose than the embossment of the present invention. First, the purpose of providing two identical V-shaped indentations in opposing tube walls is to provide symmetry to the tube, i.e., so that assembly into the heat exchanger is simplified due to the fact that it is not necessary to first orient each tube in the same orientation (i.e., with all of the single-grooved sides facing in the same direction). Obviously, this is avoided if the two sides are symmetrical. See pages 1 and 2 and claim 7 of FR '153. Since the objective is to have indentation 34 match the V-shape that is necessarily formed by the creation of indentation 32, it would clearly not be suggested to provide a different shape for indentation 34, i.e., clearly not a shape such as is used according to the present invention.

The further implication of the FR '153 specification is that the V-shaped indentation 34 is put into the tube of that reference as a kind of reinforcing structure, to maintain the integrity of the joint formed at the end of the web, i.e., to avoid a breach between the separate and parallel tube passageways 24 and 26. See page 4, line 37 through page 5, line 17 of FR '153. Again, such a purpose for the

indentation 34 is antithetical to the purpose for which the embossment is provided according to the present invention, i.e., to provide a “deformable” structure to compensate for tolerance variations of the web.

Consequently, not only does the FR ‘153 reference not disclose the structure and purpose of the embossments claimed in the present application, but the cited reference actually teaches away from any structure other than the V-shaped indentation disclosed therein. The FR ‘153 reference cannot, therefore, render obvious the presently claimed invention.

Further, some of the dependent claims of the present application recite specific dimensions for the embossments according to the invention (e.g., claims 11, 12, 20 and 21), and it is evident that these recited dimensions are not taught and cannot be achieved according to FR ‘153, i.e., and still be consistent with the V-shaped profile that is required to match the V-shaped profile of seam 32! The recited dimensions also have a purpose that is not suggested (and not achieved) by the structure shown in FR ‘153, namely, to avoid the production of a discontinuous solder junction between the tube and subsequently applied heat exchange fins. Therefore, the PTO must give weight to the dimensions set forth in these claims, as they clearly have an intended purpose that brings about advantages for the claimed product.

The Letrange reference does not rectify the deficiencies that have been noted above with respect to the FR ‘153 reference. A combination of these two references does not provide a proper basis to support a *prima facie* case of obviousness of the claimed invention.

In view of these comments, it is respectfully submitted that newly presented independent claim 10 and all of claims 11-23 that depend therefrom define subject matter that is patentable over the cited prior art. Further and favorable action in the form of a Notice of Allowance of all claims is believed to be next in order, and such action is courteously solicited.

Should there be any minor matters that are need to be attended to in order to finalize the allowance of this application, Examiner Harmon is invited to telephone the undersigned at the number shown below.

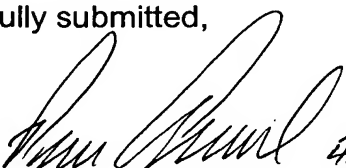
The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 672-5414
Facsimile: (202) 672-5399

By

 ^{PO-40,888}

for

Richard L. Schwaab
Attorney for Applicant
Registration No. 25,479